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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/780,696

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Hiroyuki Yoda

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NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

BERDICHEVSKY, MIRIAM

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/780,696	Applicant(s) YODA ET AL.	
	Examiner MIRIAM BERDICHEVSKY	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remarks

Claims 1-3 and 11 are amended. Claim 17 is new. Claims 1-17 are currently pending.

Status of Objections and Rejections

The objections from the previous office action are withdrawn in view of Applicant's amendment.

The rejections from the previous office action are withdrawn in view of Applicant's amendment and in view of a rejection based on more pertinent art.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 7-9, 11-12 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka (US 20030070706) and Hanoka (US 5476553).

As to claim 1, Fujioka teaches a photovoltaic module subassembly comprising:

- a plurality of photovoltaic cells arranged in an array and electrically interconnected ([0076]),
- a translucent, first substantially rigid plate member adjacent to a light receiving surface of the plurality of photovoltaic cells (4),

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- a second substantially rigid plate member of resin (7) adjacent to a non-light receiving surface of the plurality of photovoltaic cells, and a translucent filler layer located between the first and second substantially rigid plate members (6) to seal the cells wherein a light receiving surface of the photovoltaic cells is unbonded to the filler layer (figure 3) ([0063]).

Fujioka teaches that the first substantially rigid plate is flat glass with fluororesin but is silent to the first substantially rigid plate being of resin.

Hanoka teaches the use of glass or a variety of resins as transmitting substrates for use in the photovoltaic art (col. 9, line 65 to col. 10, line 8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the resin of Hanoka in Fujioka because resins are more shatter resistant than glass and Hanoka teaches that transparent plastic materials are art recognized equivalents of front and rear glass plates in solar cell modules such that substitution of a resin for glass would have been obvious to one of ordinary skill in the art (MPEP 2144).

Regarding claim 2, modified Fujioka teaches that the first plate member of resin is formed of a film containing a fluororesin as a source material (Fujioka: [0030], [0037] and 13, figure 5).

Regarding claim 3, modified Fujioka teaches that the first plate member of resin is a stack of a film containing fluororesin (Fujioka: [0030], [0037] and 13, figure 5) and a film containing PET as a source material (col. 9, line 65 to col. 10, line 8).

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Regarding claim 7, modified Fujioka teaches that the filler layer contains EVA, PVB and silicon resin as a source material ([0077]).

Regarding claim 8, modified Fujioka teaches that the plurality of cells is sealed in the filler layer ([0060] and [0050]). The Examiner notes that the lamination process/apparatus is a product by process limitation and is not given patentable weight.

Regarding claim 9, modified Fujioka teaches that the plurality of cells have a light receiving surface unbonded to the filler layer (figure 3, [0064]).

Regarding claim 11, Fujioka teaches a photovoltaic module comprising:

- a first glass plate (1),
- a second plate of glass arranged opposite the first (11),
- a spacer member forming a space between the first and second glass plates (3, 9), and
- a photovoltaic subassembly arranged in the space formed by the spacer including:
 - a plurality of photovoltaic cells arranged in an array and electrically interconnected ([0076]),
 - a translucent, first substantially rigid plate member adjacent to a light receiving surface of the plurality of photovoltaic cells (4),
 - a second substantially rigid plate member of resin (7) adjacent to a non-light receiving surface of the plurality of photovoltaic cells, and

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- translucent filler layer located between the first and second substantially rigid plate members (6), wherein the subassembly is not adhered to the first and second (figure 3).

Fujioka teaches that the first substantially rigid plate is flat glass with fluororesin but is silent to the first substantially rigid plate being of resin.

Hanoka teaches the use of glass or a variety of resins as transmitting substrates for use in the photovoltaic art (col. 9, line 65 to col. 10, line 8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the resin of Hanoka in Fujioka because resins are more shatter resistant than glass and Hanoka teaches that transparent plastic materials are art recognized equivalents of front and rear glass plates in solar cell modules such that substitution of a resin for glass would have been obvious to one of ordinary skill in the art (MPEP 2144).

Regarding claim 12, modified Fujioka teaches that the subassembly is arranged to form an air layer between the subassembly and at least one of the first and second plates of glass (2, 10, figure 3 and [0062]).

Regarding claim 16, Fujioka teaches the use of different types of glass for the glass plates selected from sheet glass (flat glass), white glass, figured glass, tempered glass and wired glass (Fujioka: [0066] and [0070]).

Regarding claim 17, modified Fujioka teaches that a light receiving surface of the photovoltaic cells is unbonded to the filler layer (figure 3) ([0063]).

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8. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka and Hanoka as applied to claim 1, in view of Yaba et al. (5,059,254).

With respect to claims 4-5, Hanoka teaches the use of transparent front and rear substrates (col. 9, line 65 to col. 10, line 8) and Fujioka teaches the use of commonly transparent material (PET) and glass on the non-light incident side of the substrate however as modified, Fujioka is not clear as to the second resin plate member being translucent (claim 4) nor wherein at least one of the first and second plate members of resin is colored and transparent (claim 5).

Yaba et al. discloses a photovoltaic module (Figure 5) with a colored polyvinyl butyral layer (4) and further teaches that it is preferable that interlayer is a colored polyvinyl butyral and transmits the visible light in ranges from 5 to 60% (col.7; lines: 40-43). Yaba et al. further teaches that if the light transmittance is higher than 60% it is difficult to reduce the glare from the back electrode and/or grid electrode of a solar cell, and if the transmittance is less than 5% then the visibility is greatly reduced (col.7; lines: 42-52).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the colored polyvinyl butyral resin interlayer of Yaba et al. to the subassembly of the photovoltaic device of Yoda in order to achieve from 5-60% visible light transmittance otherwise if the transmittance is higher than 60% it may be difficult to reduce the glare from the back electrode of the solar cell/photovoltaic module and if the transmittance is less than 5% then the visibility is greatly reduced and the colored

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transparent module of Yaba has the advantage of use as a window in for example a car (col. 1, lines 5-13).

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka and Hanoka as applied to claim 1, in view of Ichinose (US 5681402).

With respect to claim 6, modified Fujioka is silent to the subassembly of claim 4 above, wherein at least one of the first and second plate members of resin is an ultraviolet absorber.

Ichinose teaches the use well known UV absorbers in fluororesin systems for further weather protection of solar cells (col. 25, lines 26-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the UV absorber of Ichinose in the resin system of modified Fujioka because UV absorbers improve the weatherability of the resin, as taught by Ichinose (col. 25, lines 26-50).

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka and Hanoka as applied to claim 1, in view of Yoda (JP 2003026455).

Regarding claim 10, modified Fujioka teaches a subassembly comprised of a plurality of photovoltaic cells connected in series wherein electrical connections are located in the filler layer (figure 3) but does not specifically disclose the electrical connection comprising a conductive wire electrically connecting the plurality of photovoltaic cells and also allowing an external, electrical output (9) is provided in the filler layer and the filler layer has an end provided with an output terminal electrically connected to the conductive wire.

Yoda teaches a plurality of photovoltaic cells connected in series wherein a conductive wire electrically connecting (9) the plurality of photovoltaic cells (11) and also allowing an external, electrical output (9) is provided in the filler layer (4) and the filler layer (4) has an end provided with an output terminal electrically connected (9) to the conductive wire ([0048] and [0049]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the electrical connection of Yoda in modified Fujioka in order to remove the generated electricity from the subassembly while maintaining the airtightness of the module, as taught by Yoda ([0048] and [0049]).

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka and Hanoka as applied to claim 11, in view of Yoda.

Regarding claim 13, modified Fujioka teaches a spacer member fitted between the first and second plates of glass at their respective ends to allow the space to be watertight (figure 3, [0034]) but is silent to the use of butyl rubber and silicone resin as the materials which allow for the watertight nature of the spacer member.

Yoda discloses the module of claim 11 above as shown in Figure 2, wherein the spacer member has butyl rubber attached thereto and the spacer member (23) is fitted between the first (21) and second (22) plates of glass at their respective ends to pose the butyl rubber (31) between the spacer member (23) and the first (21) and second (22) plates of glass and silicone resin is applied and allowed to set outer than the spacer member (23) between the first (21) and second (22) plates' respective ends to allow the space to be watertight/waterproof (paragraph 43).

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It would have been obvious to one of ordinary skill in the art at the time of the invention to use the butyl rubber and silicone resin system of Yoda in modified Fujioka because they are well known materials in the art for providing airtightness and a waterproof seal especially since it has been held to be within the general skill of a worker in the art to select a known material on its basis of suitability for the intended use as a matter of obvious design choice (MPEP 2144.07). Furthermore, the materials of Yoda would have been obvious to try as they have the predictable result of creating a waterproof seal which is the same problem being solved as in Fujioka.

12. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka and Hanoka as applied to claim 11, in view of Sakaitani (JP2001262782).

Regarding claims 14-15, modified Fujioka is silent to the subassembly being detachable attached to the first and second glass plates and the spacer member.

Further regarding claim 15, modified Fujioka is silent to the spacer member being provided with a guide rail slidably holding the subassembly to detachably attach to the frame.

Sakaitani teaches a solar cell subassembly with spacer member is provided with a guide rail slidably holding a subassembly to detachably attach to a frame (Figure 1, paragraph 5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the sliding attachment mechanism of Sakaitani in modified Fujioka in order to easily replace defective solar cells, as taught by Sakaitani (paragraph 3, 15 & 17).

Response to Arguments

Applicant's arguments with respect to claims 1 and 11 have been considered but are moot in view of the new ground(s) of rejection as necessitated by amendment of independent claims 1 and 11.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **MIRIAM BERDICHEVSKY** whose telephone number is (571)270-5256. The examiner can normally be reached on M-Th, 7:30am-5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795